



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,767	12/02/2003	Young Woo Yoon	K-280A	1795

34610 7590 08/26/2005

FLESHNER & KIM, LLP  
P.O. BOX 221200  
CHANTILLY, VA 20153

EXAMINER

TORRES, JOSEPH D

ART UNIT PAPER NUMBER

2133

DATE MAILED: 08/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

4

## Office Action Summary

Application No.

10/724,767

Applicant(s)

YOON ET AL.

Examiner

Joseph D. Torres

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 61-86, 111-135 and 137-155 is/are pending in the application.
- 4a) Of the above claim(s) 111-135 and 137-155 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 61-86 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/898,040.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/2/03, 3/29/05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Newly submitted claims 137-155 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Newly submitted claims 137-155 are directed to interleaving properly classified in 714/701. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 137-155 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant's election with traverse of Group I (claims 61-86) in the reply filed on 07/22/2005 is acknowledged. The traversal is on the ground(s) that "I the subject matter of each of the designated inventions is sufficiently related that a thorough search for the subject matter of each of the designated inventions would encompass a search for the subject matter of the remaining designated inventions. Thus, it is respectfully submitted that the search and examination of the entire application could be made without serious burden". This is not found persuasive because a search in EAST for claim 66 requires the following keyword search "((coding code) adj rate) and (data adj rate) and channel", which results in 2524 patent documents, a search in EAST for claim 111 requires the following keyword search "((coding code) adj rate) and channel and data", which results in 5071 patent documents (2547 patent documents which are not found in the search

for claim 66) and a search in EAST for claim 137 requires the following keyword search "(interleave interleaving interleaver interleaves interleaved) and (data adj rate) and channel", which results in 9022 patent documents (7704 patent documents which are not found in the search for claim 66).

The requirement is still deemed proper and is therefore made FINAL.

Claims 111-135 and 137-155 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 07/22/2005.

### ***Claim Objections***

2. Claim 61 is objected to because of the following informalities: claim 1 recites "A method" in the preamble and it is not clear what the method is used for or what the purpose of the method is. Appropriate correction is required.

Claims 84-86 are objected to because of the following informalities: It appears that the Applicant intends for claim 84 to be an independent apparatus claim for implementing the method of claim 61 without any structural elements to define the apparatus or means for carrying the method. The Examiner recommends rewriting claim 84 as an independent claim in means plus function form or else with the structural elements necessary to carry out the method of claim 61. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). See MPEP §2164.08(a)

3. Claims 84-86 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 84 and 85 together comprise a single means, a mobile station, for carrying out the method of claim 61. Claims 84 and 86 together comprise a single means, a base station for carrying out the method of claim 61. The Examiner recommends rewriting claim 84 as an independent claim in means plus function form or else with the structural elements necessary to carry out the method of claim 61.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 61-86 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. Claim 1 recites "A method" in the preamble and it

Art Unit: 2133

is not clear what the method is used for or what the purpose of the method is. The omitted elements are: any indication to what the method of claim 61 is directed. That is, is the method used for rate matching or is it used for adaptive error correction?

Claims 66-68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 66 recites, "the coding rate of the encoder is varied according to a ratio of a size of a block interleaver and a number of bits input into the encoder over a predetermined amount of time." It is not clear how an interleaver can have a size since an interleaver is a device based on a method for interleaving. The phrase "a number of bits input into the encoder over a predetermined amount of time" is relative and it is impossible to gauge or ascertain the number of bits input into the decoder that the phrase refers to.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 61-63, 65-69, 71 and 84-86 are rejected under 35 U.S.C. 102(b) as being anticipated by 3GPP TS 25.212 V3.1.0 reference [3GPP TS 25.212 V3.1.0, 3rd

Art Unit: 2133

Generation Partnership Project; Technical Specification Group Radio Access Network; Multiplexing and channel coding (FDD) (**Release 1999**), hereafter referred to as 3GPP TS 25.212 V3.1.0].

35 U.S.C. 102(b) rejection of claims 61 and 84-86.

The 3GPP TS 25.212 V3.1.0 reference teaches during configuration of a communication channel, setting a coding rate of an encoder to an initial value (Channel Coding and Rate Matching blocks in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference are a channel encoder; the last sentence on page 13 teach that the Channel Coding block of the Channel Encoder can be initially configured to be a rate 1/2 convolutional encoder or rate 1/3 convolutional encoder; Section 4.2.3.2.1 on page 14 of the 3GPP TS 25.212 V3.1.0 reference teaches that the Channel Encoder can be initially configured to be a rate 1/3 Turbo encoder with 8-state constituent encoders; Table 1 on page 13 of the 3GPP TS 25.212 V3.1.0 reference teaches that no coding is also an option); adjusting the coding rate at the encoder by varying the coding rate from the initial value to an adjusted value (4.2.7 on page 20 of the 3GPP TS 25.212 V3.1.0 reference teaches that the Rate Matching block of the Channel Encoder in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference adjusts the coding rate at the Channel Encoder by varying the coding rate from the initial value to an adjusted value using repetition bits or puncturing); and encoding data input into the encoder at a coding rate having the adjusted value (the output of Rate Matching block of the Channel Encoder in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference is encoded data having the adjusted value set by

Art Unit: 2133

the Rate Matching block), wherein the method is implemented during at least one of variable data rate mode and flexible data rate mode (the 3GPP2, the 3rd Generation Partnership Part 2, standard is specifically designed for two transmission modes, a flexible data rate mode and a variable data rate mode).

35 U.S.C. 102(b) rejection of claim 62.

Section 4.2.3.2.1 on page 14 of the 3GPP TS 25.212 V3.1.0 reference teaches that the Channel Encoder can be initially configured to be a rate 1/3 Turbo encoder with 8-state constituent encoders.

35 U.S.C. 102(b) rejection of claim 63.

4.2.7 on page 20 of the 3GPP TS 25.212 V3.1.0 reference teaches that the Rate Matching block of the Channel Encoder in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference adjusts the coding rate at the Channel Encoder by varying the coding rate from the initial value to an adjusted value using repetition bits or puncturing.

35 U.S.C. 102(b) rejection of claim 65.

See CRC Attachment Block in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference (Note: CRC Attachment Block in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference receives information bits).

35 U.S.C. 102(b) rejection of claim 66-69.



Art Unit: 2133

The coding rate of the Channel Coding and Rate Matching blocks in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference comprising the Channel Encoder is varied according to a ratio of the size of a block interleaver for the 1st Interleaving Block in Figure 2 and a number of bits input into the Channel Encoder at the Channel Coding block in Figure 2 over a predetermined amount of time.

35 U.S.C. 102(b) rejection of claim 71.

.2.7 on page 20 of the 3GPP TS 25.212 V3.1.0 reference teaches that the Rate Matching block of the Channel Encoder in Figure 2 of the 3GPP TS 25.212 V3.1.0 reference adjusts the coding rate at the Channel Encoder by varying the coding rate from the initial value to an adjusted value using repetition bits or puncturing.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 2133

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 64 and 75-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP TS 25.212 V3.1.0 reference [3GPP TS 25.212 V3.1.0, 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Multiplexing and channel coding (FDD) (**Release 1999**), hereafter referred to as 3GPP TS 25.212 V3.1.0].

35 U.S.C. 103(a) rejection of claim 64.

The 3GPP TS 25.212 V3.1.0 reference substantially teaches the claimed invention described in claims 61-63 (as rejected above).

However the 3GPP TS 25.212 V3.1.0 reference does not explicitly teach the specific use of the first coding rate being  $1/5$ ; and the second coding rate is one of  $1/2$ ,  $1/3$ , and  $1/4$ .

Note: the 3GPP TS 25.212 V3.1.0 reference teaches use of the first coding rate being  $1/n$ ; and the second coding rate is one of  $k/l$  where  $k$ ,  $l$  and  $n$  are positive integers that can be different from each other. Selecting values for  $k$ ,  $l$  and  $n$  different from the values taught in the 3GPP TS 25.212 V3.1.0 reference does not deviate from the scope or the intent of the teachings in the 3GPP TS 25.212 V3.1.0 reference since the crux of the teachings in the 3GPP TS 25.212 V3.1.0 reference is rate matching by adjusting an initial coding rate to another coding rate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of the 3GPP TS 25.212 V3.1.0 reference

Art Unit: 2133

by including use of the first coding rate being  $1/5$ ; and the second coding rate is one of  $1/2$ ,  $1/3$ , and  $1/4$ . This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the first coding rate being  $1/5$ ; and the second coding rate is one of  $1/2$ ,  $1/3$ , and  $1/4$  would not have deviated from the scope or the intent of the teachings in the 3GPP TS 25.212 V3.1.0 reference since the crux of the teachings in the 3GPP TS 25.212 V3.1.0 reference is rate matching by adjusting an initial coding rate to another coding rate.

35 U.S.C. 103(a) rejection of claims 75-78.

The 3GPP TS 25.212 V3.1.0 substantially teaches the claimed invention described in claims 61, 69 and 71 (as rejected above).

However the 3GPP TS 25.212 V3.1.0 does not explicitly teach the specific use of specific puncturing patterns.

Note: the 3GPP TS 25.212 V3.1.0 reference teaches use of puncturing. Selecting specific puncturing schemes does not deviate from the scope or the intent of the teachings in the 3GPP TS 25.212 V3.1.0 reference since the crux of the teachings in the 3GPP TS 25.212 V3.1.0 reference is rate matching using arbitrary puncturing patterns or repetition patterns to adjust the rate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of the 3GPP TS 25.212 V3.1.0 by including use of specific puncturing patterns. This modification would have been

Art Unit: 2133

obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of specific puncturing patterns would have provided a rate matching means.

7. Claims 70, 72 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP TS 25.212 V3.1.0 reference [3GPP TS 25.212 V3.1.0, 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Multiplexing and channel coding (FDD) (**Release 1999**), hereafter referred to as 3GPP TS 25.212 V3.1.0] in view of Tzukerman; Shimon et al. (US 5438590 A, hereafter referred to as Tzukerman).

35 U.S.C. 103(a) rejection of claims 70, 72 and 73.

The 3GPP TS 25.212 V3.1.0 reference substantially teaches the claimed invention described in claims 61-69 (as rejected above).

However the 3GPP TS 25.212 V3.1.0 reference does not explicitly teach the specific use of different puncturing patterns are applied to data divided into even and odd symbol groups.

Tzukerman, in an analogous art, teaches use of different puncturing patterns are applied to data divided into even and odd symbol groups (col. 12, lines 54-64 in Tzukerman teach dividing data into even and odd groups; Table IX in Col. 13 of Tzukerman teaches different puncturing patterns applied to the even and odd symbol groups).

Art Unit: 2133

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP TS 25.212 V3.1.0 reference with the teachings of Tzukerman by including use of different puncturing patterns are applied to data divided into even and odd symbol groups. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of different puncturing patterns are applied to data divided into even and odd symbol groups would have provided the ability to adapt puncturing to individually assigned channels.

8. Claims 74 and 79-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP TS 25.212 V3.1.0 reference [3GPP TS 25.212 V3.1.0, 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Multiplexing and channel coding (FDD) (**Release 1999**), hereafter referred to as 3GPP TS 25.212 V3.1.0] and Tzukerman; Shimon et al. (US 5438590 A, hereafter referred to as Tzukerman) in view of Ero; Mustafa et al. (US 6332209 B1, hereafter referred to as Ero).

35 U.S.C. 103(a) rejection of claims 74, 79 and 80.

The 3GPP TS 25.212 V3.1.0 reference and Tzukerman substantially teaches the claimed invention described in claims 61, 69, 71 and 72 (as rejected above).

However the 3GPP TS 25.212 V3.1.0 reference and Tzukerman do not explicitly teach the specific use of separate puncturing for tail bits.

Art Unit: 2133

Eroz, in an analogous art, teaches use of separate puncturing for tail bits (see Abstract in Erozt).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the 3GPP TS 25.212 V3.1.0 reference and Tzukerman with the teachings of Erozt by including use of separate puncturing for tail bits. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of separate puncturing for tail bits would have provided the ability to use convolutional codes a different data rates.

35 U.S.C. 103(a) rejection of claims 81-83.

The 3GPP TS 25.212 V3.1.0 reference, Tzukerman and Erozt substantially teaches the claimed invention described in claims 61, 69, 71, 79 and 80 (as rejected above).

However the 3GPP TS 25.212 V3.1.0 reference, Tzukerman and Erozt does not explicitly teach the specific use of specific puncturing patterns.

Note: the 3GPP TS 25.212 V3.1.0 reference teaches use of puncturing. Selecting specific puncturing schemes does not deviate from the scope or the intent of the teachings in the 3GPP TS 25.212 V3.1.0 reference since the crux of the teachings in the 3GPP TS 25.212 V3.1.0 reference is rate matching using arbitrary puncturing patterns or repetition patterns to adjust the rate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of the 3GPP TS 25.212 V3.1.0 reference,

Art Unit: 2133

Tzukerman and Erozy by including use of specific puncturing patterns. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of specific puncturing patterns would have provided a rate matching means.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**JOSEPH TORRES  
PRIMARY EXAMINER**

Joseph D. Torres, PhD  
Primary Examiner  
Art Unit 2133